

Variations in the Wing Venation of *Pteroma plagiophleps* Hampson (Lepidoptera: Psychidae)

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Abstract. Studies on the wing venation of *P. plagiophleps* Hamp., (Psychidae) collected from different host plants and localities in Kerala State (India) have revealed the occurrence of 6 types of venational patterns in that species. Venation of moths within any given population sample also varies. Most of the observed variations related to the forewing veins 4 & 5, 8 & 9 and 11 & 12. Three of these venational patterns agreed with the venation described for the species, *P. plagiophleps*, *P. dealbata* Dierl and *P. postica* Sonan respectively. The study reveals the unreliability of using venation for the segregation of species belonging to the genus *Pteroma*. Further studies involving the morphology of adult as well as larval parts are required to resolve the correct identities of species belonging to this genus.

Introduction

The bagworm, *Pteroma plagiophleps* Hamp. is an important defoliator of several tree species in India. It was first described by Hampson (1892) from Sri Lanka (Ceylon). In southern India it was recorded as a pest of *Tamarindus indica* (Caesalpinaceae) by Ayyar (1940). Aiyer (1944) and Das (1956) recorded it as a minor pest of *Punica granata* (Lythraceae) and *Camellia thea* (Theaceae) respectively. Recently Nair et al. (1981) reported heavy defoliation of *Albizia falcataria* (Mimosaceae), in forest plantations. It was recorded from different parts of the State, defoliating *Delonix regia* (Mimosaceae), planted as avenue trees (Mathew & Nair, 1983).

In spite of such great economic importance assigned to this species, its identity is still in confusion. Segregation of taxa to the generic level is based mainly on the wing neuration and characters of leg and antennal structure (Hampson, 1892). Dierl (1971) who revised the asiatic fauna used venation as an important character for segregation of various taxa. However, wing venation previously had been shown to be too variable to have much of a classificatory value (Davis, 1964). During a study of the bagworm, *P. plagiophleps* collected on different tree species in Kerala, I observed considerable variation in the venational pattern, which causes confusion in their taxonomic identities. Earlier workers (Aiyer, 1944;

Das, 1956) also have observed some anomalies in the venation of specimens. The present study was undertaken mainly to find out the extent of variations in this character and to determine the dependability of this character in determining the taxonomic position.

Materials and Methods

Insects used in this study were obtained from pupae collected at 5 localities in Kerala State in India as follows: Vazhachal, on *Albizia falcataria*; Puthukad, on *Delonix regia*; Trichur, on *Tamarindus indica*; Mannuthy, on *Emblia officianalis* (Euphorbiaceae) and Trivandrum, on *Syzygium cumini* (Myrtaceae). Wing venation of 10 moths selected at random out of a large sample collected from each of the above hosts were studied except for the last, for which only one moth was available.

Results and Discussion

The wing venation of *P. plagiophleps* as described by previous workers (Hampson, 1892; Dierl, 1971), is characterized by the possession of nine veins in the forewing and seven in the hindwing. In the forewing, veins 4 and 5 originate from the same point, 6 and 7 are absent, 8 and 9 are stalked and 11 and 12 are shortly anastomosing. In the hindwing, vein 6 is absent and the cell is open.

The venational patterns noticed in this study are listed in Table 1. The venational pattern varied among the individuals. Among 41 moths studied, only one collected from *A. falcataria*, showed conformity with the typical venation of *P. plagiophleps*. Most of the observed variations related to the forewing veins, 4 & 5, 8 & 9 and 11 & 12. Hindwing venation remained more or less constant. The venational patterns noticed in this study may be classed as follows:

- A. Forewing with veins 11 and 12 anastomosing for a short distance.
 - B. Forewing with the veins 11 and 12 remaining free.
- Under each of these categories, 3 sub-types were also present.
- a) Forewing with veins 4 & 5 originating from the same point, and veins 8 & 9 remaining stalked (Fig. 1 c, f).
 - b) Forewing with veins 4 & 5 stalked and veins 8 & 9 originating from the same point, there being no staking (Fig. 1 b, e).
 - c) Forewing with veins 4 & 5 and 8 & 9 borne on stalks of equal or variable lengths (Fig. 1 a, d).

Of the moths examined in this study, only 6 possessed shortly fused veins 11 & 12 in the forewing (category A). Of these only one conformed to the description of *P. plagiophleps* given by Hampson (category A, a - Fig. 1c). Others were either with stalks for veins 4 & 5 and 8 & 9 or with stalk only for the veins 4 & 5.

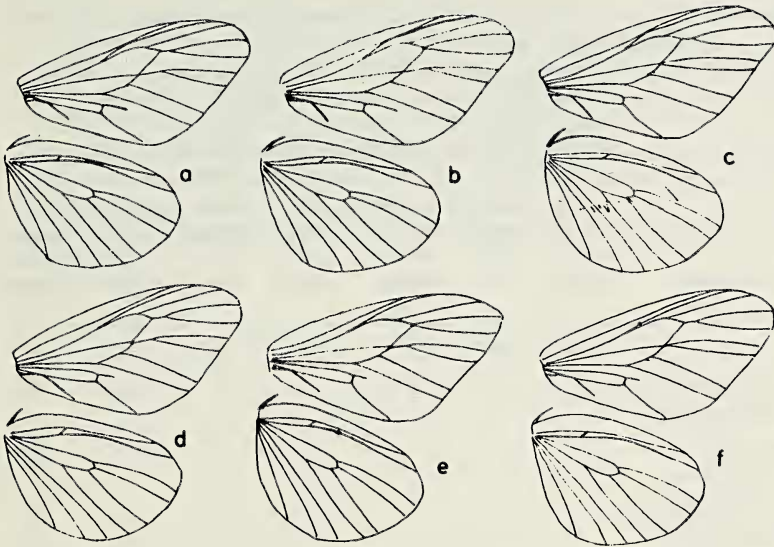


Fig. 1a-f. Venational types in *Pteroma plagiophleps* Hampson.

Thirty five moths belong to the category B (i.e., with forewing veins 11 & 12 remaining free). Of these, 24 had stalks for veins 4 & 5 and 8 & 9. In 9 moths only the veins 4 & 5 were stalked and in the remaining the stalk was for the veins 8 & 9.

As mentioned earlier, anomalies in the wing venation of *P. plagiophleps* have been noticed by Aiyer (1944) and Das (1956). In moths studied by them the forewing veins 11 and 12 were free, veins 4 & 5 and 8 & 9 were stalked (category B, c; Fig. 1d). Dierl (1971) has described species of similar venation as *P. dealbata* from specimens collected in China. Similarly, the venational type wherein the forewing veins 11 & 12 are free with only the veins 4 & 5 remaining stalked (category B, b; Fig. 1e) have been recognized as *P. postica* by Sonan (1935) in Taiwan (Formosa). The occurrence of these species in the Indian subregion has not been reported. The inter- and intrapopulation variations observed in this study clearly indicates that venation cannot be considered as a stable character for delineation of taxa at least in the bagworm genus *Pteroma*. A detailed taxonomic revision involving studies on the morphology of adult as well as larval parts may be required to resolve the correct identities of species belonging to this genus.

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Table 1. Venational characteristics of *Pteroma plagiophleps* collected on different hosts.

Host Species	Category A			Category B			Total No. of insects Examined
	Forewing veins 11 & 12 fused			Forewing with veins 11 & 12 free			
	4 & 5 free 8 & 9 stalked	4 & 5 stalked 8 & 9 free	4 & 5 and 8 & 9 stalked	4 & 5 free 8 & 9 stalked	4 & 5 stalked 8 & 9 free	4 & 5 and 8 & 9 stalked	
(a)	(b)*	(c)*	(a)*	(b)	(c)		
<i>Albizia falcataria</i> (Loc. Vazhachal)	1	2	1		2	4	10
<i>Delonix regia</i> (Loc. Puthukad)					3	7	10
<i>Emblica officianalis</i> (Loc. Mannuthy)		1		1	2	6	10
<i>Tamarindus indicus</i> (Loc. Trichur)			1	1	2	6	10
<i>Syzygium cumini</i> (Loc. Trivandrum)						1	1
TOTAL	1 (2.34%)	3 (7.31%)	2 (4.87%)	2 (4.87%)	9 (21.95%)	24 (58.53)	41

Category A. a — Venation of *P. plagiophleps* (Hampson, 1892; Dierl, 1971)

Category B. b — Venation of *P. postica* (Sonan, 1935)

Category B. c — Venation of *P. dealbata* (Dierl, 1971)

*New venational types recorded in this study.

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